

Engineering and Operations Workgroup Study Plans

Study #1e: Feather River
Temperature Model Development

November 16, 2001

Goals

- Develop appropriate Feather River temperature model to simulate temperatures in the Lower Feather River
- Integrate into the overall modeling scheme
- Perform benchmark simulations

Task 1. Define desired outputs from model

- Feather River temperatures at various locations in low flow channel and downstream of the Thermalito Afterbay return

Task 2. Review existing models

- UCD Feather River Temperature model (RMA 10)
 - Hourly time step
 - Fish barrier dam to Sacramento River
 - Used to help DWR understand temperature at Robinson's Riffle for compliance purposes
- USBR Feather River Temperature Model
 - Monthly time step
 - Limited verification and use
- USCE developed HEC-5Q model
 - Daily time step
 - Developed for USCE training purposes

Task 3. Review existing data

- Channel characteristics
- Flow characteristics (flows and temperatures at various locations)
- Climatic data (temperature, solar radiation, wind, etc.)

Task 4. Review modeling tools

- Modeling tools include:
 - QUAL2E (1-D)
 - WQRRS (1-D)
 - RMA 2 and 11 (1-D)
 - MIKE-11 (1D)

Task 5. Select appropriate model or modeling tool

- Based on the results of task 1 through 4 select the appropriate model/modeling tool to create the Oroville Reservoir temperature model for this process
- Get approval from plenary group

Task 6. Collect field data for development, calibration, and verification

- Identify additional data required
- Install instrumentation as required
- Collect data

Task 7. Model Development, Calibration, and Verification

- Define system to be modeled and schematic to be used
- Develop physical system definition in model
- Develop time-series input data (hydrologic, operational)
- Calibrate model
- Verify completed model

Task 8 – Integrate into modeling scheme

- Use definitions from Study Plan 1, Tasks 1 and 5
- Finalize transfer utilities and process

Task 9. Perform benchmark simulations

- Get boundary conditions from central modeling database
- Perform the actual simulations
- Use utility programs to load data into central modeling database

Products

- Feather River temperature model
- Benchmark Feather River temperature simulation results